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### Historical Asset Volatility Ratios (in 1,000's)

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

<b>Actuarial Valuation Date</b>	<b>Market Value of Assets</b>	<b>Plan Year Payroll</b>	<b>Asset Volatility Ratio</b>
6/30/2015	\$ 148,638	\$ 44,713	3.32
6/30/2016	154,685	47,108	3.28
6/30/2017	175,841	49,381	3.56
6/30/2018	193,523	50,823	3.81
6/30/2019	206,347	51,677	3.99
6/30/2020	212,910	53,825	3.96
6/30/2021	273,392	60,023	4.55
6/30/2022	260,437	54,287	4.80

The assets at June 30, 2022 are 480% of payroll, so underperforming the investment return assumption by 1.00% (i.e., earn 6.30% for one year) is equivalent to 4.80% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAAL, this illustrates the risk associated with volatile investment returns.





## Section VII: Risk Considerations

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### Historical Cash Flows (in 1,000's)

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments and administrative expenses. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. The System currently has positive cash flow. It appears that the System's net cash flow is trending from positive to negative. While there are no immediate concerns, this should be continued to be monitored going forward.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2015	\$ 148,638	\$ 9,012	\$ 5,553	\$ 3,459	2.33%
6/30/2016	154,685	9,314	6,431	2,883	1.86%
6/30/2017	175,841	9,742	7,175	2,567	1.46%
6/30/2018	193,523	10,125	8,028	2,097	1.08%
6/30/2019	206,347	10,252	8,552	1,700	0.82%
6/30/2020	212,910	10,672	9,693	979	0.46%
6/30/2021	273,392	11,804	10,404	1,400	0.51%
6/30/2022	260,437	11,016	12,250	(1,234)	(0.47%)



## Section VII: Risk Considerations

### Liability Maturity Measurement

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. The retirement of the remaining baby boomers over the next decade is expected to further exacerbate the aging of the retirement system population. Retiree liability as a percentage of the total actuarial accrued liability has been growing over the last five years. As more of the total liability begins to reside with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs. Below are two tables which demonstrate the ratio of the System's retiree liability compared to the total accrued liability and the ratio of the number of retirees and beneficiaries to the number of active members.

<b>Year End</b>	<b>Retiree Liability (a)</b>	<b>Total Actuarial Accrued Liability (b)</b>	<b>Retiree Percentage (a) / (b)</b>
6/30/2015	\$67,112,776	\$172,159,908	39.0%
6/30/2016	77,744,132	191,007,338	40.7%
6/30/2017	90,203,382	217,642,368	41.4%
6/30/2018	101,651,278	230,077,307	44.2%
6/30/2019	115,460,624	245,129,744	47.1%
6/30/2020	129,547,563	264,744,609	48.9%
6/30/2021	147,946,717	290,855,880	50.9%
6/30/2022	169,265,874	320,475,204	52.8%

### Historical Member Statistics

<b>Valuation Date June 30,</b>	<b>Number of</b>		<b>Active/ Retired</b>
	<b>Active</b>	<b>Retired</b>	
2015	993	231	4.30
2016	989	250	3.96
2017	1,012	276	3.67
2018	1,010	312	3.24
2019	1,021	346	2.95
2020	1,033	384	2.69
2021	1,023	420	2.44
2022	977	445	2.20



## **Appendix A: Actuarial Procedures and Methods**

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The assumptions and methods utilized in the valuation were developed in the five-year experience study for the period ending June 30, 2021.

Tables B-3 through B-5 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment.

### **Actuarial Cost Method**

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate is defined to equal the total of the individual normal costs, divided by the total pay rate.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the UAAL. The UAAL is amortized as a level percentage of the projected salaries of present and future members of the System.

### **Records and Data**

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates, and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data has been supplied by the System and was accepted for valuation purposes without audit.

### **Replacement of Terminated Members**

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

### **Administrative and Investment Expenses**

The administrative and investment expenses of the System are assumed to be funded by investment earnings in excess of 7.30% per year.

### **Valuation of Assets**

The actuarial asset valuation method spreads asset gains and losses over four years. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of four years.



## **Appendix A: Actuarial Procedures and Methods**

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### **Investment Earnings**

The annual rate of investment earnings of the assets of the System is assumed to be 7.30% per year net of administrative and investment expenses, compounded annually.

### **Interest on Member Contributions**

Interest on member contributions is assumed to accrue at the most recent actual rate granted, or a rate of 0.22% per annum, compounded annually.

### **Future Salaries**

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table B-2. In addition to increases in salary due to merit and longevity, this scale includes an assumed 3.50% annual rate of increase in the general wage level of the membership.

### **Service Retirement**

Table B-3 shows the annual assumed rates of retirement for actives members meeting the service retirement eligibilities.

### **Disablement**

The rates of disablement used in this valuation are illustrated in Table B-4.

### **Mortality**

The mortality rates used in this valuation are described in Table B-1. 10% of all member deaths are assumed to be duty-related.

### **Other Terminations of Employment**

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table B-5.

### **Probability of Marriage & Dependent Children**

If death occurs in active status, all members are assumed to have an eligible surviving spouse with no dependent children.

### **Records with no Birth Date**

New records with no birth date are assumed to be 37 years old. Records that are not new and have no birth date used the same birth date as the prior year's valuation.

### **Active Records with a Salary Less than \$1,000**

These members are included in the active headcounts, however the pay of these members is not included in the Valuation Projected Salaries summarized in Appendix D. The liability for these members is their accumulated member contributions payable on the valuation date.



**Appendix B: Summary of Valuation Assumptions**

**Table B-1**

**Summary of Valuation Assumptions**

I. Economic assumptions	
A. General wage increases	3.50%
B. Investment return	7.30%
C. Price inflation assumption	2.75%
D. Payroll growth	3.25%
E. Growth in membership	0.00%
F. Interest on member accounts	0.22%
II. Demographic assumptions	
A. Individual salary increase due to promotion and longevity	Table B-2
B. Retirement	Table B-3
C. Disablement	Table B-4
D. Mortality among contributing members	
For Males and Females: PUB 2010 Safety Amount Weighted Employee Mortality Table projected to 2021. Projected generationally using MP-2021.	
E. Mortality among service retired members	
For Males and Females: PUB 2010 Safety Amount Weighted Healthy Retiree Mortality Table projected to 2021, set forward one year for males, adjusted 105% for males and 100% for females. Projected generationally using MP-2021.	
F. Mortality among beneficiaries	
For Males and Females: PUB 2010 Safety Amount Weighted Contingent Survivor Mortality Table projected to 2021, set forward one year for males. Projected generationally using MP-2021.	
G. Mortality among disabled members	
For Males and Females: PUB 2010 Safety Amount Weighted Disabled Retiree Mortality Table projected to 2021, set forward one year for males.	
H. Other terminations of employment	Table B-5



**Appendix B: Summary of Valuation Assumptions**

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**Table B-2**

**Future Salaries**

Years of Service	(a) Individual Merit & Longevity	(b) General Wage Increase	(1+(a))*(1+(b)) Total Salary Increase
0-1	6.40%	3.50%	10.12%
1-2	4.70	3.50	8.36
2-3	3.60	3.50	7.23
3-4	2.70	3.50	6.29
4-5	2.00	3.50	5.57
5-6	1.40	3.50	4.95
6 & Up	1.00	3.50	4.54



**Table B-3**  
**Retirement**  
**Annual Rates**

<u>Age</u>	<u>Age 55 with 5 Years of Service</u>	<u>Age 50 with 20 Years of Service</u>
Less than 50	N/A	0%
50	N/A	15.0
51	N/A	15.0
52	N/A	15.0
53	N/A	15.0
54	N/A	15.0
55	15.0	18.0
56	5.0	18.0
57	5.0	18.0
58	5.0	18.0
59	5.0	18.0
60	15.0	18.0
61	15.0	41.0
62	40.0	50.0
63	15.0	35.0
64	15.0	20.0
65 & Over	100.0	100.0



**Appendix B: Summary of Valuation Assumptions**

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**Table B-4**  
**Disablement**  
**Annual Rates**

<u>Age</u>	<u>All Members</u>
22	0.00%
27	0.11
32	0.11
37	0.11
42	0.37
47	0.37
52	0.37
57	0.36
62	0.00

75% of disabilities are assumed to be duty-related. All disabilities are assumed to be permanent and without recovery.





**Table B-5**

**Other Terminations of Employment  
Among Members Not Eligible to Retire  
Annual Rates**

<b>Years of Service</b>	<b>All Members</b>
0	30.00%
1	23.00
2	17.00
3	13.00
4	13.00
5	9.25
6	8.75
7	8.75
8	8.75
9	8.75
10	7.75
11	5.00
12	5.00
13	4.00
14 & Over	3.00

**Family Composition**

100% of active members are assumed to be married. Female spouses are assumed to be three years younger than males. Actual marital characteristics are used for pensioners.

**Vested Benefits for Termination Members**

Vested benefits for members who terminated during years ending June 30, 2009 and later were estimated based upon compensation and service information in the census data. For members who terminated prior to June 30, 2008, vested benefits valued were the same as had been calculated by the prior actuary for the June 30, 2008 actuarial valuation.



## **Appendix C: Summary of Benefit Provisions**

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- Service credit**
- Service credit is used to determine the amount of a member's retirement benefit.
  - One month of service credit is earned for each month where the member is paid for 160 hours. This includes certain transferred and purchased service.
- Membership service**
- Membership service is used to determine eligibility for vesting, retirement or other benefits.
  - One month of membership service is earned for any month member contributions are made, regardless of the number of hours worked.
  - Eligible members in all systems may purchase service that counts toward membership service.
  - Additionally, eligible active and inactive Sheriffs' Retirement System (SRS) members may purchase 1 for 5 (additional) service that will count as membership service.
- Contributions**
- Member contributions are made through an "employer pick-up" arrangement which results in deferral of taxes on the contributions.
- Compensation**
- Compensation generally means all remuneration paid, excluding certain allowances, benefits, and lump sum payments. Compensation is specifically defined in law and differs amongst the systems.
  - Bonuses paid **on or after** July 1, 2013 to any member will not be treated as compensation for retirement purposes. No member or employer contributions will be paid on bonuses.
- Withdrawal of employee contributions**
- A member is eligible for a withdrawal of their contributions when they terminate service and are either not eligible for or have not taken a retirement benefit.
  - The member receives the accumulated member contributions, which consists of member contributions and regular interest.
  - Upon receipt of a refund of accumulated contributions a member's vested right to a monthly benefit is forfeited.
- Member contributions interest credited (regular interest)**
- Interest is credited to member accounts at the rates determined by the Board.
  - The current interest rate credited to member accounts is 0.22%.
- Working Retiree Limitations**
- Applies to retirement system members who return **on or after** July 1, 2017 to covered employment in the system from which they retired. These limits already applied to SRS members before July 1, 2017.
- Members who return for **less than 480 hours** in a **calendar year**:
    - may not become an active member in the system; and
    - are subject to a \$1 reduction in their retirement benefit for each \$3 earned in excess of \$5,000 in the calendar year.



## Appendix C: Summary of Benefit Provisions

- Members who return for **480 or more hours** in a **calendar year**;
  - must become an active member of the system;
  - will stop receiving a retirement benefit from the system;  
**and**
  - will be eligible for a second retirement benefit if they earn 5 or more years of service credit through their second employment.
- Employee, employer and state contributions apply as follows:
  - Employer contributions and state contributions (if any) must be paid on all working retirees;
  - Employee contributions must be paid on working retirees who return to covered employment for 480 or more hours in a calendar year.

NOTE: PERS has its own limits.

### **Second Retirement Benefit -**

Applies to retirement system members who return on or after July 1, 2017 to active service covered by the system from which they retired.

- If the member works more than 480 hours in a calendar year and accumulates less than 5 years of service credit before terminating again, the member:
  - is not awarded service credit for the period of reemployment;
  - is refunded the accumulated contributions associated with the period of reemployment;
  - starting the first month following termination of service, receives the same retirement benefit previously paid to the member; and
  - does not accrue post-retirement benefit adjustments during the term of reemployment but receives a GABA in January immediately following second retirement.
- If the member works more than 480 hours in a calendar year and accumulates at least 5 years of service credit before terminating again, the member:
  - is awarded service credit for the period of reemployment;
  - starting the first month following termination of service, receives:
    - \* the same retirement benefit previously paid to the member; **and**
    - \* a second retirement benefit for the period of reemployment calculated based on the laws in effect as of the member's rehire date; **and**
  - does not accrue post-retirement benefit adjustments during the term of reemployment but receives a GABA:
    - \* on the initial retirement benefit in January immediately following second retirement; **and**



## **Appendix C: Summary of Benefit Provisions**

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- \* on the second retirement benefit starting in January after receiving that benefit for at least 12 months.
  - A member who returns to covered service is **not** eligible for a disability benefit.
- Refunds**
- Terminating members eligible to retire may, in lieu of receiving a monthly retirement benefit, refund their accumulated contributions in a lump sum.
  - Terminating members with accumulated contributions between \$200 and \$1,000 who wish to rollover their refund must do so within 90 days of termination of service.
  - Trusts, estates, and charitable organizations listed as beneficiaries are entitled to receive only a lump sum payment.
- Lump-sum payouts**
- Effective July 1, 2017, lump sum payouts in all systems are limited to the member's accumulated contributions rather than the present value of the member's benefit.
- Type of plan**
- Multiple-employer cost sharing
- Membership eligibility**
- Game wardens
  - Warden supervisor
  - State peace officers
- Member contributions**
- 10.56% of member's compensation
- Employer contributions**
- 9.0% of each member's compensation
- Compensation period used in benefit calculation**
- HAC = Highest Average Compensation
  - Hired **prior to** July 1, 2011: HAC is average of the highest 36 consecutive months (or shorter period of total service) of compensation paid to member.
  - Hired **on or after** July 1, 2011: HAC is average of the highest 60 consecutive months (or shorter period of total service) of compensation paid to member.
  - Hired **on or after** July 1, 2013: 110% annual cap on compensation considered as part of a member's HAC.
- Service retirement eligibility and benefit formula**
- Age 50 with 20 years of membership service
  - 2.5% of HAC x years of service credit
- Early retirement eligibility and benefit**
- Age 55 with 5 years of membership service
  - A reduced retirement benefit calculated using the HAC and service credit at early retirement.



## Appendix C: Summary of Benefit Provisions

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### Disability retirement eligibility and benefit formula

#### Duty-related disability:

- Vested active member
- 5 years of membership service
- **Less than 20 years** of membership: 50% or HAC, or
- **20 years or more** of membership service: 2.5% of HAC x years of service credit

#### Regular disability:

- Vested member
- The actuarial equivalent of the accrued normal retirement benefit at the time of disability.

### Survivor's eligibility and benefit formula

**Duty-related deaths: (active member)**, a monthly survivor benefit to the designated beneficiary equal to:

- **25 years or less** of membership service: 50% of HAC, or
- **More than 25 years** of membership service: 2.5% of HAC x years of service credit.

#### Non-duty-related deaths:

- Active or inactive member
- Lump-sum refund of the member's accumulated contributions; **or**
- Actuarial equivalent of the service benefit.

- Effective July 1, 2017, beneficiaries of GWPORS members who die prior to retirement are eligible for either a lump-sum benefit or a monthly survivor benefit. The monthly survivor benefit may be paid out as an option 1, 2, 3 or 4, at the survivor's discretion. Previously, statute provided for lump-sum payments only.

### Vested eligibility and benefit

- 5 years of membership service
- Accrued normal retirement benefit, payable when eligible for retirement.
- In lieu of a pension, a member may receive a refund of accumulated contributions.
- Upon receipt of a refund of accumulated contributions, a member's vested right to a monthly benefit is forfeited.



## Appendix C: Summary of Benefit Provisions

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|--|--|
| <b>Retirement benefits -<br/>Form of payment</b> | <ul style="list-style-type: none"><li>• Option 1, the normal form of payment is a single life annuity with a refund of any remaining accumulated contributions (account balance) to a designated beneficiary.</li><li>• Optional Benefits:<ul style="list-style-type: none"><li>• Option 2, a life annuity and joint 100% survivor benefit,</li><li>• Option 3, a life annuity and joint 50 % survivor benefit, and</li><li>• Option 4, a life annuity with a period certain.</li></ul></li><li>• If a retiring member selects Option 2 or 3 and the contingent annuitant predeceases or is divorced from the member, the retiree may, within 18 months of the death or divorce, choose to revert to the higher Option 1 benefit available at retirement or the retiree may select a different contingent annuitant and/or a different option.</li></ul> |
| <b>Post retirement benefit<br/>increases</b>     | <p>For retired members who have been retired at least 12 months, a Guaranteed Annual Benefit Adjustment (GABA) will be made each year in January equal to:</p> <ul style="list-style-type: none"><li>• 3% for members hired <b>before</b> July 1, 2007, and</li><li>• 1.5% for members hired <b>on or after</b> July 1, 2007</li></ul>   |
| <b>Changes since last<br/>valuation</b>          | <ul style="list-style-type: none"><li>• None</li></ul>   |



**Appendix D: Valuation Data**

**Valuation Data**

This chart is presented for informational purposes only. The counts shown in the valuation line were used for preparation of the liabilities disclosed within this report. The counts disclosed for the Annual Financial Report and the Board Summary (page 1) match the ACFR at the request of the Board. The differences between counts, if any, have no material effect upon the liability calculation.

	<u>Active</u>	<u>Disabled</u>	<u>Retirees and Beneficiaries</u>	<u>Terminated Vested Members</u>	<u>Terminated Non-Vested Members</u>	<u>Total</u>
<b>Participant Counts Used for Valuation</b>	977	21	424	169	588	2,179
Disabled Members having attained normal retirement age		(18)	18			
Beneficiaries of Disabled Members						
Beneficiaries with less than one year of certain payments remaining						
Other Adjustments				1	1	2
<b>Participant Counts shown in the Annual Financial Report</b>	977	3	442	170	589	2,181



## Appendix D: Valuation Data

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This valuation is based upon the membership of the System as of June 30, 2022. Membership data were supplied by the System and has been accepted for valuation purposes without audit. However, tests were performed to ensure that the data are sufficiently accurate for valuation purposes.

The salaries used in the tables and charts which follow are different than the salaries used for the Summary of Results on page 1. The valuation salaries are anticipated to be paid for the following fiscal year, whereas the Summary of Results salaries are applicable in the year ending on the valuation date.

<u>Active Members</u>	<u>Number</u>	<u>Valuation Projected Salaries</u>
Full-Time Members	881	\$ 52,564,444
Part-Time Members	<u>96</u>	<u>\$ 1,807,926</u>
Total Active Members	977	\$ 54,372,370

Table D-1 contains summaries of the data for contributing members. For full-time members, values shown in the tables are the numbers of members and their total and average annual salaries. For part-time members, only the numbers of members are shown.

Table D-2 presents distributions of the following:

- Members receiving service retirement benefits.
- Members receiving disability retirement benefits.
- Survivors of deceased retired members receiving benefits.
- Survivors of deceased active members.
- Terminated vested members.

Table D-3 is a reconciliation of membership data from June 30, 2021 to June 30, 2022.





## Appendix D: Valuation Data

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The following is a summary of retired members and beneficiaries currently receiving benefits. The chart reflects the counts and benefits used for valuation purposes as a result of data processing. Please refer to the chart on page 43 for an explanation of the number of annuitants used for valuation purposes.

<u>Type of Annuitant</u>	<u>Number</u>	<u>Annual Benefits</u>	<u>Average Annual Benefits</u>
Service Retirement	393	\$ 9,718,438	\$ 24,729
Survivors of Deceased Retired Members	19	448,519	23,606
Survivors of Deceased Active Members	12	158,878	13,240
Total Retirees and Beneficiaries	424	\$ 10,325,835	\$ 24,353
Disability Retirement	21	480,553	22,883
Total Annuitants	445	\$ 10,806,388	\$ 24,284

<u>Terminated Members with Contributions Not Withdrawn</u>	<u>Number</u>
Vested Terminated Members	169
Non-Vested Terminated Members	<u>588</u>
Total Terminated Members	757



**Table D-1:  
Active Members Distribution of  
Full-Time Employees and Salaries  
as of June 30, 2022**

**Number of Employees**

Age	<u>Completed Years of Service</u>											Totals		
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39		40+	
<25	18	13	10	6										47
25 to 29	13	26	13	34	28									114
30 to 34	12	13	17	27	31	13	2							115
35 to 39	4	8	5	20	38	24	12							111
40 to 44	8	5	10	14	33	28	25	9						132
45 to 49	7	2	7	10	26	22	24	18	3					119
50 to 54	3	7	4	15	10	12	27	12	8	1				99
55 to 59	2	2	1	10	15	19	11	12	2		1			75
60 to 64	2	4	2	9	5	11	9	8	1	4				55
65 to 69	1			2	1	2	4		1					11
70 and up					1	1	1							3
<b>Totals</b>	<b>70</b>	<b>80</b>	<b>69</b>	<b>147</b>	<b>188</b>	<b>132</b>	<b>115</b>	<b>59</b>	<b>15</b>	<b>5</b>	<b>1</b>	<b>-</b>	<b>881</b>	



**Table D-1:  
Active Members Distribution of  
Full-Time Employees and Salaries  
as of June 30, 2022**

**Annual Salaries in Thousands**

Age	Completed Years of Service											Totals		
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39		40+	
<25	878	590	475	305										2,248
25 to 29	650	1,231	611	1,827	1,743									6,062
30 to 34	566	616	838	1,451	1,905	759	130							6,265
35 to 39	227	388	256	1,081	2,210	1,543	820							6,524
40 to 44	455	241	576	715	1,904	1,820	1,743	616						8,068
45 to 49	330	122	340	644	1,523	1,434	1,796	1,280	304					7,774
50 to 54	177	291	249	910	597	754	1,833	862	668	82				6,425
55 to 59	66	149	63	642	949	1,175	710	908	156		90			4,909
60 to 64	104	174	105	538	365	666	553	556	87	284				3,432
65 to 69	42			118	58	98	271		64					650
70 and up					52	87	69							208
Totals	3,495	3,802	3,513	8,231	11,306	8,336	7,925	4,223	1,278	366	90	-		52,564



**Table D-1:  
Active Members Distribution of  
Full-Time Employees and Salaries  
as of June 30, 2022**

**Average Annual Salary**

Age	Completed Years of Service											Totals	
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39		40+
<25	48,802	45,368	47,524	50,768									47,831
25 to 29	49,977	47,353	47,008	53,748	62,251								53,179
30 to 34	47,198	47,349	49,292	53,731	61,459	58,368	65,112						54,477
35 to 39	56,812	48,500	51,131	54,033	58,164	64,292	68,304						58,779
40 to 44	56,874	48,216	57,567	51,057	57,683	64,991	69,720	68,392					61,124
45 to 49	47,156	60,758	48,586	64,437	58,585	65,188	74,849	71,134	101,176				65,326
50 to 54	59,150	41,628	62,243	60,670	59,745	62,872	67,883	71,853	83,507	81,687			64,895
55 to 59	32,817	74,622	62,577	64,229	63,290	61,848	64,566	75,661	78,046		90,357		65,451
60 to 64	51,947	43,448	52,658	59,736	72,966	60,561	61,449	69,553	86,668	70,993			62,395
65 to 69	41,534			59,017	57,562	48,995	67,699		63,753				59,061
70 and up					52,034	86,598	69,109						69,247
Totals	49,934	47,519	50,907	55,990	60,141	63,151	68,915	71,568	85,206	73,132	90,357		59,665

The salary shown in the above chart was used for valuation purposes and assumes pay increases for the year.



**Table D-1:  
Active Members Distribution of  
Part-Time Employees  
as of June 30, 2022**

**Number of Employees**

Age	<u>Completed Years of Service</u>											Totals	
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39		40+
<25	6	1	2	1									10
25 to 29	10	2	2	4	1								19
30 to 34	9		2	1	3								15
35 to 39	13			1									14
40 to 44	7	2	1	1		1							12
45 to 49	4			1		1			1				7
50 to 54	4		1	1	2	1							9
55 to 59	3												3
60 to 64	2				2								4
65 to 69	1						1						2
70 and up	1												1
Totals	60	5	8	10	8	3	1	-	1	-	-	-	96



**Appendix D: Valuation Data**

**Table D-2:  
Distribution of Inactive Lives**

The charts reflects the counts and benefits used for valuation purposes as a result of data processing. Please refer to the chart on page 43 for an explanation of the number of annuitants used for valuation purposes.

**Members Receiving Service Retirement Benefits as of June 30, 2022**

Age	Number of Persons	Annual Benefits	Average Annual Benefits
<50	-	\$ -	\$ -
50 to 54	28	938,994	33,535
55 to 59	76	1,983,243	26,095
60 to 64	86	2,069,982	24,070
65 to 69	92	2,282,964	24,815
70 to 74	64	1,195,996	18,687
75 to 79	25	597,348	23,894
80 to 84	14	351,074	25,077
85 to 89	6	241,065	40,177
90 and up	2	57,772	28,886
Totals	393	\$ 9,718,438	\$ 24,729

**Members Receiving Disability Retirement Benefits as of June 30, 2022**

Age	Number of Persons	Annual Benefits	Average Annual Benefits
<50	3	\$ 59,335	\$ 19,778
50 to 54	1	27,146	27,146
55 to 59	2	30,880	15,440
60 to 64	4	79,925	19,981
65 to 69	3	71,007	23,669
70 to 74	4	105,578	26,395
75 to 79	2	51,541	25,771
80 to 84	-	-	-
85 to 89	2	55,141	27,570
90 and up	-	-	-
Totals	21	\$ 480,553	\$ 22,883



Table D-2:
Distribution of Inactive Lives

The charts reflects the counts and benefits used for valuation purposes as a result of data processing. Please refer to the chart on page 43 for an explanation of the number of annuitants used for valuation purposes.

Survivors of Deceased Retired Members as of June 30, 2022

Table with 4 columns: Age, Number of Persons, Annual Benefits, Average Annual Benefits. Rows include age groups from <50 to 90 and up, and a Totals row.

Survivors of Deceased Active Members as of June 30, 2022

Table with 4 columns: Age, Number of Persons, Annual Benefits, Average Annual Benefits. Rows include age groups from <50 to 90 and up, and a Totals row.



**Table D-2:  
Distribution of Inactive Lives**

The chart reflects the counts and benefits used for valuation purposes as a result of data processing. Please refer to the chart on page 43 for an explanation of the number of annuitants used for valuation purposes.

**Terminated Vested Members as of June 30, 2022  
Number of Persons**

<u>Age</u>	<u>Number</u>
<25	
25 to 29	3
30 to 34	17
35 to 39	27
40 to 44	26
45 to 49	33
50 to 54	46
55 to 59	10
60 to 64	5
65 to 69	2
70 and above	
Total	169





**Table D-3:  
Data Reconciliation**

The following table shows a reconciliation of the participants used in the previous valuation to this valuation. This chart reflects the counts used for valuation purposes as a result of data processing.

	<u>Active Members</u>	<u>Terminated Vested Members</u>	<u>Service Retired Members</u>	<u>Disabled Members</u>	<u>Survivors and Beneficiaries</u>
<b>June 30, 2021 Valuation</b>	1,023	148	369	21	30
Refunds and Non-Vested Terminations	(115)	(4)			
Vested Terminations	(33)	33			
Service Retirements	(26)	(5)	31		
Disability Retirements	(1)			1	
Deaths	(1)			(1)	1
New Entrants	122				1
Rehires	10	(3)	(1)		
Other	(2)		(6)		(1)
<b>June 30, 2022 Valuation</b>	977	169	393	21	31



## **Appendix E: Comparative Schedules**

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### **Comparative Schedules**

This section contains tables that summarize the experience of the System shown in present and past valuation reports.

Table E-1 shows a summary of the active members covered as of the various valuation dates.

Table E-2 shows a summary of the retired and inactive members as of the various valuation dates.

Table E-3 summarizes the contribution rates determined by each annual actuarial valuation.



**Table E-1:  
Active Membership Data**

<u>Valuation Date June 30,</u>	<u>Actives</u>	<u>Annual Salaries in Thousands</u>	<u>Average Annual Salary</u>	<u>Average Age</u>	<u>Average Years of Service</u>	<u>Average Hire Age</u>
2022	977	54,287	55,565	42.1	8.5	33.6
2021	1,023	60,023	58,673	41.4	8.1	33.3
2020	1,033	53,825	52,106	41.4	7.9	33.4
2019	1,021	51,677	50,614	41.7	8.0	33.8
2018	1,010	50,823	50,320	42.0	8.1	34.0
2017	1,012	49,381	48,795	42.0	8.1	33.9
2016	989	47,108	47,632	40.2	7.9	32.3
2015	993	44,713	45,029	42.2	7.6	34.6
2014	955	40,458	42,365			
2013	971	39,155	40,324			
2012	972	38,317	39,421			



Table E-2: Members in Receipt of Annuities and Inactive Membership Data

Valuation Date June 30,	Number	All Annuitants					Terminated Members	
		Annual Benefits in Thousands	Average Annual Benefit	Average Current Age	Average Age at Retirement	Average Service at Retirement	Number Vested Terminated	Number Non-Vested Terminated
2022	445	10,806	24,284	65.1	57.7	19.0	169	588
2021	420	9,920	23,618	64.8	57.8	18.9	148	523
2020	384	8,615	22,434	64.7	57.8	18.8	135	494
2019	346	7,624	22,034	64.4	57.7	18.5	138	447
2018	312	6,792	21,768	66.0	56.4	17.0	123	381
2017	276	5,958	21,586	66.3	56.3	17.8	114	304
2016	250	5,286	21,144	66.3	57.8	18.3	105	278
2015	231	4,721	20,437	66.3	56.4	18.5	95	235
2014	203	4,106	20,227				87	175
2013	180	3,606	20,033				69	148
2012	163	3,317	20,350				64	146



**Appendix E: Comparative Schedules**

**Table E-3:  
Contribution Rates**

Valuation Date	Contribution Rates			Normal Cost Rate*	UAAL Rate**
	Employee	Employer/State	Total		
June 30, 2022	9.00 %	10.56 %	19.56 %	18.50 %	1.06 %
2021	9.00	10.56	19.56	15.70	3.86
2020	9.00	10.56	19.56	15.61	3.95
2019	9.00	10.56	19.56	16.16	3.40
2018	9.00	10.56	19.56	16.32	3.24
2017	9.00	10.56	19.56	16.19	3.37
2016	9.00	10.56	19.56	18.23	1.33
2015	9.00	10.56	19.56	18.41	1.15
2014	9.00	10.56	19.56	18.58	0.98
2013	9.00	10.56	19.56	18.82	0.74
2012	9.00	10.56	19.56	18.98	0.58

\* Includes administrative expenses for the 2014 through 2021 Valuation Dates.

\*\* The UAAL rate is the amount available to amortize the UAAL. It is equal to the total contribution rate, minus the normal cost rate.



## **Appendix F: Financial Statement Information**

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The information presented in the required supplementary schedules was determined as part of the actuarial valuation as of June 30, 2022. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2022
Actuarial cost method	Entry Age Normal
Amortization method	Open
Remaining amortization period	30 Years
Asset valuation method	Four-year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.30%
General wage growth*	3.50%
Merit salary increases	1.0% - 6.4%
*Includes inflation	2.75%



**Appendix F: Financial Statement Information**

Gain and Loss in Accrued Liability During Years Ended June 30 Resulting from Differences Between Assumed Experience and Actual Experience						
Type of Activity	Gain or (Loss) for Year Ending June 30, (expressed in thousands)					
	2017	2018	2019	2020	2021	2022
Investment Income on Actuarial Value of Assets	\$ 645	\$ (1,127)	\$ (710)	\$ (1,369)	\$ 7,011	\$ 1,031
Combined Liability Experience	(5,352)	4,375	1,891	(2,638)	(8,280)	10,036
(Loss)/Gain During Year from Financial Experience	\$ (4,707)	\$ 3,248	\$ 1,181	\$ (4,007)	\$ (1,269)	\$ 11,067
Non-Recurring Items	(5,308)	0	0	0	0	(20,907)
Composite Gain or (Loss) During Year	\$ (10,015)	\$ 3,248	\$ 1,181	\$ (4,007)	\$ (1,269)	\$ (9,840)

Schedule of Funding Progress (expressed in thousands)						
Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Funded Ratio	Unfunded AAL (UAAL)	Covered Payroll	UAAL as a Percentage of Covered Payroll
June 30, 2022	\$ 266,067	\$ 320,475	83%	\$ 54,408	\$ 54,287	100%
2021	247,392	290,856	85%	43,464	60,023	72%
2020	221,949	264,745	84%	42,796	53,825	80%
2019	206,504	245,130	84%	38,626	51,677	75%
2018	190,849	230,077	83%	39,228	50,823	77%
2017	176,311	217,642	81%	41,332	49,381	84%



**Appendix F: Financial Statement Information**

Solvency Test Aggregate Accrued Liabilities for (expressed in thousands)								
Valuation Date June 30,	Active Member Contributions	Retirees & Beneficiaries	Active Member Employer Financed Contributions	Actuarial Value of Reported Assets	Portion of Accrued Liability Covered by Reported Assets			
	(1)	(2)	(3)		(1)	(2)	(3)	
2022	\$ 45,643	\$ 148,131	\$ 126,701	\$ 266,067	100%	100%	57%	
2021	44,689	131,732	114,435	247,392	100%	100%	62%	
2020	43,619	113,801	107,325	221,949	100%	100%	60%	
2019	41,429	100,024	103,677	206,504	100%	100%	63%	
2018	39,605	88,621	101,851	190,849	100%	100%	61%	
2017	39,205	77,897	100,540	176,311	100%	100%	59%	





## **Appendix G: Glossary**

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The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Game Wardens' and Peace Officers' Retirement System. Defined terms are capitalized throughout this Appendix.

### **Accrued Benefit**

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

### **Actuarial Accrued Liability**

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

### **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

### **Actuarial Cost Method**

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

### **Actuarial Gain (Loss)**

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

### **Actuarial Present Value**

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

### **Actuarial Valuation**

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.



## **Appendix G: Glossary**

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### **Actuarial Value of Assets**

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

### **Actuarially Equivalent**

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

### **Amortization Payment**

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

### **Entry Age Actuarial Cost Method**

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

### **Market Value of Assets**

The fair value of cash, investments and other property belonging to a pension plan that could be acquired by exchanging them on the open market.

### **Normal Cost**

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

### **Projected Benefits**

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

### **Unaccrued Benefit**

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.

### **Unfunded Actuarial Accrued Liability**

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.